PATENT
Attorney Docket No. 210091

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Hinken et al.

Art Unit: Unassigned

Application No. Unassigned
(U.S. National Phase of PCT/EP99/07440)

Examiner: Unassigned

Filed: April 4, 2001

For: TESTING DEVICE FOR DETECTING AND LOCALIZING MATERIAL INHOMOGENEITIES

CLAIMS AS AMENDED ON APRIL 4, 2001

1. Canceled.

2. Canceled.

3. Canceled.

4. Canceled.

5. Canceled.

6. Canceled.

7. Canceled.

8. Canceled.

9. Canceled.

10. Canceled.

11. Canceled.

12. (New) A testing device for detecting and localising material inhomogeneities in electrically conductive samples comprising a holder for the sample to be tested, a temperature setting device for forming a temperature profile in the sample, and at least one measuring sensor for the contactless measurement of the magnetic field outside the sample, wherein several measuring sensors are provided at a different distance to the sample.

13. (New) The testing device of claim 12, wherein the holder is connected to a rotational drive for rotating the sample.

14. (New) The testing device of claim 12, wherein the measuring sensors comprise a Squid sensor.

15. (New) The testing device of claim 14, wherein the Squid sensor is a Squid magnetometer.

16. (New) The testing device of claim 14, wherein Squid sensor comprises a Squid gradiometer.

17. (New) The testing device of claim 13, wherein the measuring sensors comprise a Squid sensor.

18. (New) The testing device of claim 17, wherein the Squid sensor is a Squid magnetometer.

19. (New) The testing device of claim 17, wherein Squid sensor comprises a Squid gradiometer.

20. (New) A method for detecting and localising material inhomogeneities in electrically conductive samples, wherein the sample is brought to a predetermined

temperature profile and the magnetic field outside the sample is contactlessly measured, wherein the magnetic field outside the sample is measured with several measuring sensors which are provided at a different distance to the sample.

21. (New) The method of claim 20, wherein the sample is rotated.

22. (New) The method of claim 20, wherein from the polarity of the measuring signal and the direction of the temperature gradient one may infer the type of homogeneity.

23. (New) The method of claim 21, wherein from the polarity of the measuring signal and the direction of the temperature gradient one may infer the type of homogeneity.

24. (New) The method of claim 20, wherein for the improved localization and shape determination of the inhomogeneity the temperature profile in the sample is differently set in subsequent measurements.

25. (New) The method of claim 21, wherein for the improved localization and shape determination of the inhomogeneity the temperature profile in the sample is differently set in subsequent measurements.

26. (New) The method of claim 22, wherein for the improved localization and shape determination of the inhomogeneity the temperature profile in the sample is differently set in subsequent measurements.

27. (New) The method of claim 23, wherein for the improved localization and shape determination of the inhomogeneity the temperature profile in the sample is differently set in subsequent measurements.

28. (New) The method of claim 20, wherein, in subsequent measurements, the magnetic field is measured at different distances to the sample.

29. (New) The method of claim 20, wherein one simultaneously measures with several measuring sensors.

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12. A testing device for detecting and localising material inhomogeneities in electrically conductive samples comprising a holder for the sample to be tested, a temperature setting device for forming a temperature profile in the sample, and at least one measuring sensor for the contactless measurement of the magnetic field outside the sample, wherein several measuring sensors are provided at a different distance to the sample.

13. The testing device of claim 12, wherein the holder is connected to a rotational drive for rotating the sample.

14. The testing device of claim 12, wherein the measuring sensors comprise a Squid sensor.

15. The testing device of claim 14, wherein the Squid sensor is a Squid magnetometer.

16. The testing device of claim 14, wherein Squid sensor comprises a Squid gradiometer.

17. The testing device of claim 13, wherein the measuring sensors comprise a Squid sensor.

18. The testing device of claim 17, wherein the Squid sensor is a Squid magnetometer.

19. The testing device of claim 17, wherein Squid sensor comprises a Squid gradiometer.

20. A method for detecting and localising material inhomogeneities in electrically conductive samples, wherein the sample is brought to a predetermined temperature profile and the magnetic field outside the sample is contactlessly measured, wherein the magnetic field outside the sample is measured with several measuring sensors which are provided at a different distance to the sample.

21. The method of claim 20, wherein the sample is rotated.

22. The method of claim 20, wherein from the polarity of the measuring signal and the direction of the temperature gradient one may infer the type of homogeneity.

23. The method of claim 21, wherein from the polarity of the measuring signal and the direction of the temperature gradient one may infer the type of homogeneity.

24. The method of claim 20, wherein for the improved localization and shape determination of the inhomogeneity the temperature profile in the sample is differently set in subsequent measurements.

25. The method of claim 21, wherein for the improved localization and shape determination of the inhomogeneity the temperature profile in the sample is differently set in subsequent measurements.

26. The method of claim 22, wherein for the improved localization and shape determination of the inhomogeneity the temperature profile in the sample is differently set in subsequent measurements.

27. The method of claim 23, wherein for the improved localization and shape determination of the inhomogeneity the temperature profile in the sample is differently set in subsequent measurements.

28. The method of claim 20, wherein, in subsequent measurements, the magnetic field is measured at different distances to the sample.

29. The method of claim 20, wherein one simultaneously measures with several measuring sensors.